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United States General Accounting Office
Report to the Chairman, Committee on
National Security, House of
Representatives

November 1996

EXPORT CONTROLS

Sale of Telecommunications Equipment to China



GAO-96-100
11/19/96

United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

B-274526

November 13, 1996

The Honorable Floyd D. Spence
Chairman, Committee on National Security
House of Representatives

As you requested, we reviewed the sale of advanced telecommunications equipment to the People's Republic of China. Specifically, you asked about the transfer of broadband telecommunications equipment to HuaMei, a joint venture between SCM Brooks Telecommunications, a U.S. limited partnership, and Galaxy New Technology, a Chinese company primarily owned by an agency of the Chinese military. The equipment included Asynchronous Transfer Mode (ATM) and Synchronous Digital Hierarchy (SDH) equipment, which were used to demonstrate the commercial capabilities of a broadband telecommunications network among several hotels in Guangzhou, China. ATM and SDH operate on a broadband network to transmit voice, data, images, and video communications at high rates of speed.

Our objectives were to determine (1) the civil and military applications of the exported telecommunications equipment, its availability, and the importance of these applications to China's military and (2) the process and rationale for liberalizing the export of telecommunications equipment, such as the ATM and SDH equipment shipped to HuaMei.

Background

The U.S. Department of Commerce controls the export of U.S. dual-use commodities, software, and technology by requiring validated licenses prior to shipment unless a license exception applies.¹ A license exception, formerly known as a general license, is a broad grant of authority to export certain goods and technology without prior government review. Dual-use telecommunications items are controlled under the Commerce Control List, which specifies the items that require validated licenses, generally for reasons of national security.

During the Cold War, the United States sought international coordination of export controls through the Coordinating Committee for Multilateral Export Controls (COCOM), which was made up primarily of North Atlantic Treaty Organization member countries.² With the end of the Cold War,

¹"Dual use" refers to items that may be used for civil or military purposes.

²COCOM members included all of the North Atlantic Treaty Organization member countries, except for Iceland, plus Australia and Japan.

cocom members pushed for liberalization of many dual-use items, including telecommunications equipment, computers, and machine tools. However, before COCOM ended on March 31, 1994, participant countries agreed to continue controlling dual-use items, at each country's discretion, after COCOM's expiration. The new U.S. export control arrangement, established in 1996, focuses export controls on several potential aggressor countries, such as Iraq, Libya, and North Korea, and away from former communist countries.

Results in Brief

There are numerous civil and military applications for broadband telecommunications equipment, such as ATM and SDH, including video-conferencing, remote command and control, and telemedicine. Since the liberalization of exports of advanced telecommunications equipment, such equipment is now readily available in China. SDH equipment, in particular, is being manufactured and used to upgrade China's telecommunications networks to international standards. According to U.S. government officials, the Chinese military is seeking to acquire ATM and SDH equipment, which may benefit their command and control networks by the end of the next decade. Furthermore, these officials stated that as China's telecommunications infrastructure is modernized, the Chinese military will also benefit.

The creation of the new General License category, GLX, by the Commerce Department in April 1994, allowed the export of ATM and SDH equipment to HuaMei without a validated license having to be issued by the Commerce Department. ATM and SDH equipment were two of a number of dual-use telecommunications items that were included under GLX. GLX includes many items that would have been typically approved for export to civil end users in the licensing process. According to U.S. government officials, GLX was created in response to the end of the Cold War and the expiration of COCOM, to ease export restrictions and reduce administrative burdens on U.S. exporters.

Determining who is a civil end user under GLX is the responsibility of the exporting companies. However, this is particularly difficult in China because of the Chinese military's significant involvement in various commercial ventures. There is no information readily available to exporters on how much military involvement in a commercial entity constitutes a military end user. Based on this one case, we are not making any recommendations. However, as the Commerce Department gains

experience under GLX,³ it may want to assess the need to provide additional information or guidance to exporters to help them determine when they should request a government review of an end user.

Applications, Availability, and Importance of Exported Telecommunications Equipment

Civil and Military Applications of ATM and SDH Equipment

Broadband telecommunications equipment, such as ATM and SDH, have numerous civilian and military applications and are becoming increasingly available in China as it strives to improve its telecommunications networks to meet international standards. According to U.S. government officials, overall improvements to China's telecommunications networks will likely benefit the Chinese military as well.

Broadband networks employ ATM and SDH equipment to transfer data, voice, and video communications simultaneously at high rates of speed. ATM is a flexible switching technique used to transfer information over advanced telecommunications networks. SDH technology is used for high speed transmission of data, video, and voice traffic. Both ATM and SDH equipment were developed by commercial industry for civil applications, and they are now increasingly used worldwide on broadband telecommunications networks.

Civil applications of ATM and SDH equipment generally allow work groups to collaborate quickly and efficiently over a computer network. These applications include holding a meeting simultaneously in several locations (video-conferencing), having people in different locations work simultaneously on the same document (virtual notebook), and transmitting X-rays and other medical records from one location to another (telemedicine). ATM and SDH equipment are necessary to have the speed of delivery, quick data retrieval, and clear video images that are needed for these applications to operate.

Military applications for ATM and SDH equipment are similar to civilian applications. These applications include sharing of intelligence, imagery and video between several locations, command and control of military operations using video-conferencing, and medical support and

³On March 25, 1996, GLX and several other general license categories were consolidated into the license exception "CIV" for exports going to civil end users. CIV does not provide additional guidance to exporters on how much military involvement is needed before a commercial entity is considered a military end user. Even though the designation "GLX" is no longer in use, we continue to use it throughout our report since the telecommunications equipment exported to Huamei was liberalized as a result of the creation of that license exception.

telemedicine between the battlefield and remote hospitals. When used in a military application, both types of equipment require encryption devices to protect communications from interception. The Department of Defense buys such equipment "off-the-shelf" and is still testing it for potential military uses. According to Defense officials, ATM and SDH equipment will be beneficial to military functions, such as command and control, and will form the basis for future Defense Department communications networks.

Availability of ATM and SDH Equipment in China

Both ATM and SDH equipment are considered to be advanced technologies in the telecommunications industry and are now increasingly deployed worldwide. While ATM equipment has only recently become readily available, SDH has been commercially available for at least the last 5 years. In 1993, a U.S. company claimed that foreign producers of SDH equipment were marketing to China and urged the Commerce Department to reduce its controls on such equipment. SDH equipment was found to be foreign available by the Commerce Department in 1994.⁴ Former COCOM member countries tightly controlled the export of such equipment until 1994, when controls on telecommunications items were relaxed.

Prior to the liberalization of exports of dual-use telecommunications equipment in April 1994, the export of ATM and SDH equipment to China would have required a validated license from the Commerce Department. According to company officials, since the removal of most export restrictions on telecommunications equipment, the market for such equipment in China has grown quickly and large quantities of SDH equipment have been sold to China to modernize its commercial long-distance telecommunications network. Advanced telecommunications equipment, particularly SDH, is increasingly used to be consistent with the emerging international telecommunications standards, and it should vastly improve China's outdated and underdeveloped telecommunications systems. According to industry officials, U.S. companies sold tens of millions of dollars worth of SDH equipment in China in 1994, and several joint ventures are currently manufacturing SDH equipment in China to build China's telecommunications network. In contrast, there is little demand for ATM equipment in China and there is no in-country production of such equipment. Company officials noted the demand for ATM equipment in the United States is also limited.

⁴Under Export Administration regulations, when an item is found to be foreign available, it may be removed from the Commerce Control List and no longer controlled. A foreign availability finding means that the good or commodity is available to countries subject to export controls, in sufficient quantity and comparable quality from sources outside the United States, making denial of an export license ineffective in achieving the purpose of the controls.

Importance of ATM and SDH Equipment to Chinese Military

Officials at the Defense Department told us that the Chinese military would like to improve its telecommunications capabilities. According to these officials, the Chinese military is seeking to acquire ATM and SDH equipment, which may increase their operational readiness by the end of the next decade. Defense Department officials told us that broadband telecommunications equipment could be used to improve the Chinese military's command and control communications networks. These officials also observed that the Chinese military will benefit from the improvements to China's overall public telecommunications system, since they also make use of that system.

The Chinese military may also benefit from the use of broadband equipment in its nonmilitary activities. For example, Chinese Army hospitals, which also serve civilians, are interested in acquiring high-speed telecommunications links using ATM switches to develop telemedicine capabilities and to extend health care to rural areas. The Chinese military operates at least one-third of the hospitals in China.

New General License Category Liberalizes Export of ATM and SDH Equipment

The Commerce Department created GLX in 1994, allowing nearly all dual-use telecommunications items to be exported to Chinese civil end users without validated licenses. As a result, the ATM and SDH equipment exported to HuaMei did not require prior government approval before being shipped.

Creation of the General License GLX

According to U.S. government officials, the Commerce Department created GLX in April 1994 to ease export restrictions and reduce administrative burdens on U.S. exporters. In September 1993, the Trade Promotion Coordinating Committee, chaired by the Secretary of Commerce, recommended removing export controls on computers and telecommunications products to aid key U.S. industries. Commerce officials noted that there was an interagency effort to determine which items to decontrol before COCOM expired at the end of March 1994.

The Commerce Department used the advisory notes from the Commerce Control List as a basis for what items were to be included under GLX. Advisory notes are included in the list to advise exporters of the items likely to be approved for export to certain locations. The Commerce Department removed the requirement for a validated license and prior government review on all items with advisory notes because it viewed the items as being less sensitive.

According to a Commerce Department official, the advisory note items included under GLX did not necessarily include the entire category of equipment, nor did they apply to China. For example, one advisory note stated that licenses would likely be approved for the export of telecommunications transmission equipment, such as SDH, to China, provided that such equipment did not exceed certain capabilities. Under GLX, all SDH equipment is eligible for export to China, regardless of capability. Another advisory note stated that licenses would likely be approved for the export of all controlled dual-use telecommunications equipment, including ATM, for civil end use in Estonia, Latvia, and Lithuania. According to a Commerce Department official, since ATM equipment was included in this advisory note, it became eligible for export under GLX, even though the note did not apply to China.

Our analysis of the telecommunications items included under GLX showed that each item category was covered by some advisory note on the Commerce Control List. Because most of the telecommunications items on the list were covered by advisory notes, they became eligible for export under GLX. The only telecommunications items covered by an advisory note that were not included under GLX were radio frequency hopping equipment and radio receivers with certain scanning and frequency switching capabilities. Items included under GLX were telecommunications transmission equipment, switching equipment, optical fiber communication cables, and phased array antennas. However, technology for the development and production of the telecommunications equipment may not be exported under GLX.

The Commerce Department officially requested comments from other agencies on GLX on March 17, 1994, and the creation of GLX was announced in the Federal Register on April 4, 1994. According to government officials, the period of time given to other agencies to comment on the new license category was limited due to the expiration of COCOM at the end of March 1994. Senior Commerce and Defense Department officials stated that while the comment period provided to the agencies for approving GLX was limited, the items included under GLX were less sensitive and had been previously considered for liberalization under earlier COCOM-related negotiations. The Departments of Defense, Energy, and State all approved the new license category.

HuaMei Exports Covered By GLX

At the time that AT&T exported U.S. telecommunications equipment to HuaMei in 1994, the Commerce Department had already created GLX, so

AT&T did not need to apply for a license to ship ATM and SDH equipment to China. In 1993, SCM Brooks Telecommunications entered into a joint venture with Galaxy New Technology, a Chinese company controlled by the Commission of Science, Technology, and Industry for National Defense (COSTIND), an agency of the Chinese military,⁵ to form Guangzhou HuaMei Communications Limited. The purpose of the HuaMei project was to demonstrate the commercial capabilities of a broadband telecommunications network, using several hotels in Guangzhou. The demonstration included video-conferencing, virtual notebook, and teleradiology applications. HuaMei contracted with AT&T to provide the equipment necessary for the project. AT&T exported three ATM switches from the United States under a general license and four SDH transmission systems from the Netherlands under a Dutch validated license to Guangzhou in the fall of 1994.

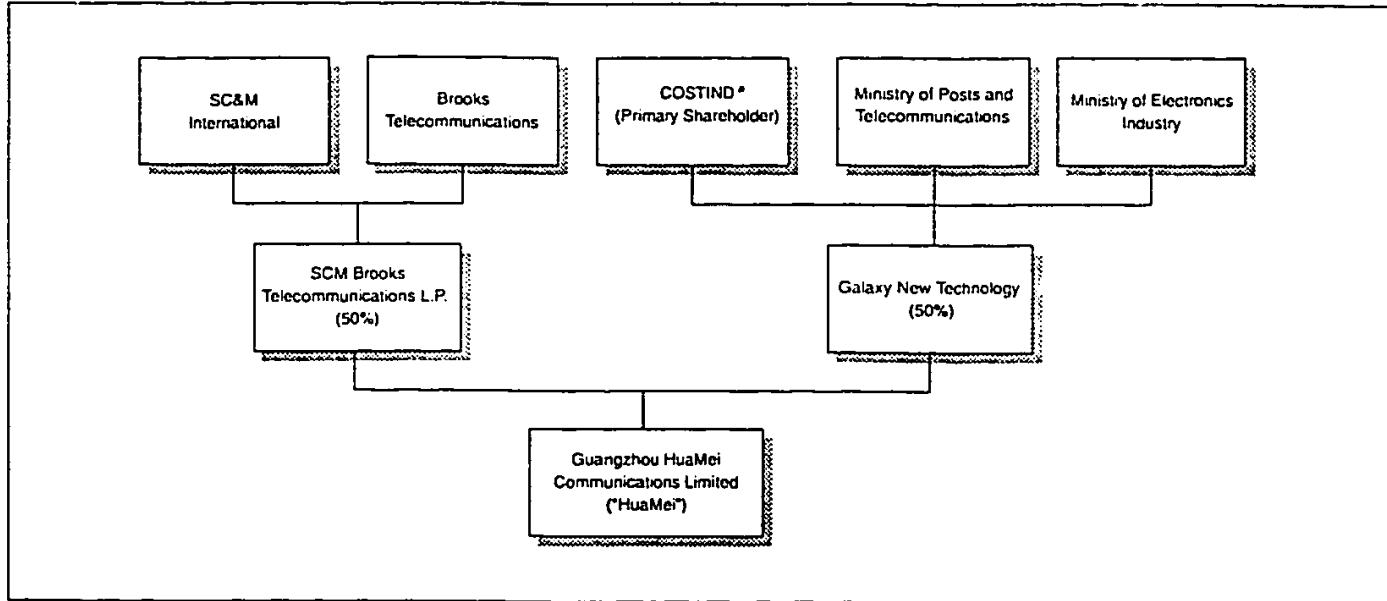
Civil End User Not Defined Under GLX

GLX allows the export of ATM and SDH equipment to China without a validated license, if the exports are going to "civil end-users for civil end-uses." However, Commerce Department regulations do not define a "civil end-user" or offer any guidance on how an exporter is to determine who is a civil end user in China. U.S. company and government officials stated that determining end users in China is problematic because the Chinese military is often involved in commercial activities. The Chinese military invests in and owns numerous commercial entities in China to obtain profits and to help fund its military activities. For example, according to industry officials, the military has investments in such enterprises as the Palace Hotel in Beijing, various entertainment projects, and even restaurants.

HuaMei, while a commercial enterprise, has as its principal Chinese partner, a company controlled by the Chinese military. As shown in figure 1, SCM Brooks Telecommunications and Galaxy New Technology each own 50 percent of HuaMei. However, the Chinese military is the primary shareholder of Galaxy New Technology, with two other Chinese government agencies each holding a minority interest in the company. Several members of the HuaMei board of directors are military officers or have direct ties to the Chinese military. Such a high degree of involvement in HuaMei could indicate a strong military interest in this company.

⁵COSTIND oversees development of China's weapon systems and is responsible for identifying and acquiring telecommunications technology applicable for military use.

Figure 1: HuaMei Ownership



*Commission of Science, Technology, and Industry for National Defense.

U.S. company and government officials stated that HuaMei was a civil end user. In determining that, company officials considered the end use of the equipment, the location of the installed equipment, and the customers for the equipment. Since the equipment was being used for video-conferencing among several Chinese hotels to demonstrate the commercial applications of this technology, company officials were confident that the export of this equipment would satisfy the civil end-user requirement of GLX.

According to Commerce Department officials, the agency does not have guidance for its staff to use in making civil end-user determinations for exports under GLX (or its successor, CIV),⁶ nor has it issued guidelines on end-user determination for exporters. For an export to China that requires a validated license, the Commerce Department normally conducts a review of the application and determines if the export is going to a military or civil end user on a case-by-case basis, using available government resources such as embassy personnel and intelligence reports. Exporters do not have such resources available to them when making a civil end-user determination. Currently, there is no guidance or criteria available to

⁶As noted above, CIV does not provide additional clarification about how much military involvement in a commercial entity constitutes a military end user.

exporters on how much military involvement in a commercial entity is needed before it is considered a military end user.

According to Commerce Department officials, an exporter is responsible for knowing its end user when exporting under GLX (or CIV). An exporter is encouraged to come to the Commerce Department for an end-user check if there are any abnormal circumstances in a transaction that indicate the export may be going to an inappropriate end user. According to Commerce Department guidance, these circumstances can include orders for items that are inconsistent with the purchaser's needs or a customer declining installation and testing when included in the sale price. If there are no suspicious circumstances, the exporter is not required to verify the buyer's representations of civil end use. AT&T officials stated that they did not ask the Commerce Department to determine if HuaMei was a civil end user, nor were they required to under GLX.

Commerce officials stated that the civil end-user requirement in GLX was specifically included to allow Commerce to review exports going to the military. However, in the export of telecommunications equipment to HuaMei, the Commerce Department did not have an opportunity to review the end user because prior government review is not required under GLX. Consequently, the equipment was exported to HuaMei without Commerce review, even though the company was partially controlled by several high-level members of the Chinese military.

Agency Comments and Our Evaluation

In commenting on a draft of this report, the Departments of Commerce, Defense, and State generally agreed with the information we presented. Commerce noted that our suggestion that it assess the need to provide additional guidance to exporters on determining civil end users as it gains experience under CIV (formerly known as GLX) was helpful. Commerce also asserted that our report confirmed that its decision to make certain telecommunications equipment available to China without requiring a validated license was consistent with both U.S. national security and economic interests. However, it should be noted that determining consistency with U.S. interests was not within the scope of our work. We made minor technical corrections to the report where appropriate based on suggestions provided by the Departments of Commerce and Defense. Comments from the Departments of Commerce, Defense, and State are presented in appendixes I, II, and III, respectively.

Scope and Methodology

To obtain information about the HuaMei project—when it was created, its purpose, and the equipment it employed—we interviewed SCM Brooks and AT&T officials and examined company agreements and project descriptions.

To determine civil and military applications of ATM and SDH equipment, availability of the equipment, and the importance of those applications to China's military, we interviewed officials from AT&T and SCM Brooks and obtained technical descriptions of the products and potential applications. We also interviewed officials from the National Security Agency, the Defense Technology Security Administration, the Defense Intelligence Agency, and the Defense Information Security Agency, as well as the Commerce Department Bureau of Export Administration to get expert assessments of advanced telecommunications equipment and data on telecommunications equipment availability in China. In addition, we interviewed telecommunications industry and U.S. embassy officials in China to obtain information about the applications and availability of ATM and SDH equipment in China.

To examine the process and rationale for liberalizing the export of broadband telecommunications equipment, we reviewed a chronology of the export of AT&T equipment. We also interviewed officials from the Departments of Defense, Commerce, and State, and the National Security Agency to obtain data on the rationale and purposes of creating the GLX license category, as well as agency positions on the inclusion of telecommunications equipment under GLX. We reviewed Defense and Commerce Department documentation on the development of GLX. We also compared the items on GLX with the Commerce Control List items covered by advisory notes to confirm the method used to develop GLX. We performed our review from March to October 1996 in accordance with generally accepted government auditing standards.

As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution of this report until 10 days after its issue date. At that time, we will send copies to other congressional committees and the Secretaries of Defense, Commerce, and State. We will also make copies available to other interested parties upon request.

Please contact me at (202) 512-4383 if you or your staff have any questions concerning this report. Major contributors to this report were Karen Zuckerstein, David C. Trimble, and John Neumann.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Katherine V. Schinasi". The signature is fluid and cursive, with "Katherine" on the top line and "V. Schinasi" on the bottom line.

Katherine V. Schinasi
Associate Director
Defense Acquisition Issues

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Figure 1: HuaMei Ownership

Abbreviations

ATM	Asynchronous Transfer Mode
COCOM	Coordinating Committee for Multilateral Export Controls
COSTIND	Commission of Science, Technology, and Industry for National Defense
SDH	Synchronous Digital Hierarchy

Comments From the Department of Commerce



THE SECRETARY OF COMMERCE
Washington, DC 20230

11

Ms. Katherine V. Schinasi
Associate Director
Defense Acquisition Issues
United States General Accounting Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Ms. Schinasi:

The Department of Commerce has reviewed the General Accounting Office's draft report on the Sale of Telecommunications Equipment to China. I believe that the report confirms that our decision to make certain telecommunications equipment available to civil end users in China without requiring a validated license is consistent with both U.S. national security and our economic interests.

I note the suggestion that we may wish to consider assessing our practice in regard to license exception CIV (referred to in the report by its former designation of general license GLX) as we gain experience. I believe this suggestion is helpful. I have also enclosed some technical comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Kantor".

Michael Kantor

Enclosure

Comments From the Department of Defense



OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
2600 DEFENSE PENTAGON
WASHINGTON, DC 20301-2600



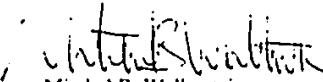
10 OCT 1996

Ms. Katherine Schinasi
Associate Director, Defense Acquisition Issues,
National Security and International
Affairs Division
U.S. General Accounting Office
Washington, D.C. 29548

Dear Ms. Schinasi:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft reports, EXPORT CONTROLS: "Sensitive Machine Tool Exports to China," dated September 23, 1996 (GAO Code 707165), OSD Case 1232; and "Sale of Telecommunications Equipment to China," dated September 23, 1996 (GAO Code 707178), OSD Case 1233.

The Department of Defense has reviewed the reports and has no objection. Technical corrections were separately provided. The Department appreciates the opportunity to comment on the draft reports.


Mitchel B. Wallerstein
Deputy Assistant Secretary of Defense
Counterproliferation Policy



Comments From the Department of State

United States Department of State

Washington, D.C. 20520

GAO 41-602

Dear Mr. Hinton:

We appreciated the opportunity to review your draft reports on export controls, "Sensitive Machine Tool Exports to China" and "Sale of Telecommunications Equipment To China," GAO/NSIAD-97-4, GAO Job Code 707165 and GAO/NSIAD-97-5, GAO Job Code 707178, respectively.

The Department of State notes that the reports address a number of concerns that the Congress has raised about sensitive dual-use exports to China. We found that both reports contain a balanced and reasoned analysis of the issues raised by the exports of machine tools and broadband telecommunication equipment to China. To the best of our knowledge, the reports clearly and accurately reflect the historical background of both cases.

We would, however, like to make two specific comments aimed at clarifying statements made in the machine tools report. First, the fourth sentence in the last paragraph on page 6 suggests that former COCOM members decided to control machine tool exports to China. Although China is not mentioned in that particular sentence, it is mentioned in the previous sentence. We believe it would be clearer to state that "In March 1994, the Committee disbanded, but former members agreed to retain global controls on 5-axis machine tools on the COCOM list through eliminating prenotification requirements."

Secondly, we recommend that you delete the second sentence in the first paragraph on page 8 which states that the Commerce and Defense Departments were the primary reviewers of the McDonnell Douglas license applications. This creates the misimpression that there are "primary" agencies involved in interagency license review. In fact, all agencies involved have an equal voice in the decision making process.

We hope that the comments we have conveyed are useful. If you have any questions, please call Mr. O'Mara, PM/ATEC, at (202) 647-1837.

Sincerely,

Kathleen J. Charles
Kathleen J. Charles, Acting
Chief Financial Officer

Mr. Henry L. Hinton, Jr.
Assistant Comptroller General,
National Security and International Affairs,
U.S. General Accounting Office.